

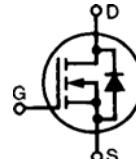
HiPerFET™ Power MOSFETs Q-Class

IXFH 40N50Q IXFT 40N50Q

V_{DSS} = 500 V
I_{D25} = 40 A
R_{DS(on)} = 0.14 Ω

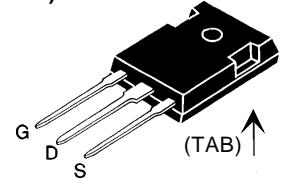
t_{rr} ≤ 250 ns

N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, High dv/dt

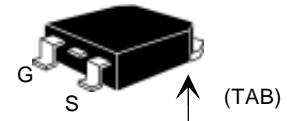


Symbol	Test Conditions	Maximum Ratings	
V _{DSS}	T _J = 25°C to 150°C	500	V
V _{DGR}	T _J = 25°C to 150°C; R _{GS} = 1 MΩ	500	V
V _{GS}	Continuous	±30	V
V _{GSM}	Transient	±40	V
I _{D25}	T _C = 25°C	40	A
I _{DM}	T _C = 25°C, pulse width limited by T _{JM}	160	A
I _{AR}	T _C = 25°C	40	A
E _{AR}	T _C = 25°C	50	mJ
E _{AS}		2.0	mJ
dv/dt	I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 2 Ω	20	V/ns
P _D	T _C = 25°C	500	W
T _J		-55 to +150	°C
T _{JM}		150	°C
T _{stg}		-55 to +150	°C
T _L	1.6 mm (0.063 in) from case for 10 s	300	°C
M _d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

TO-247 AD (IXFH)



TO-268 (D3) (IXFT)



G = Gate D = Drain
S = Source TAB = Drain

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
 - easier to drive
 - faster switching
- International standard packages
- Low R_{DS(on)}
- Rated for unclamped Inductive load switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

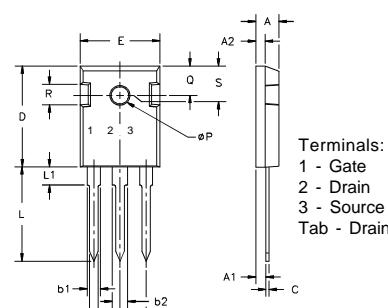
Advantages

- Easy to mount
- Space savings
- High power density

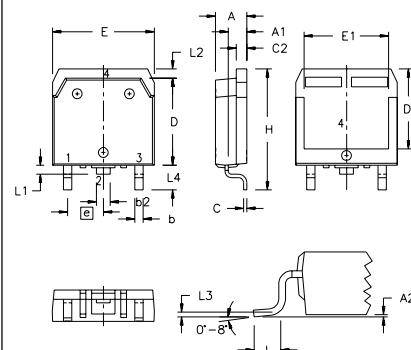
Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)	min.	typ.
V _{DSS}	V _{GS} = 0 V, I _D = 250 μA	500		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 4 mA	2.5		V
I _{GSS}	V _{GS} = ±30 V _{DC} , V _{DS} = 0		±100	nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0 V	T _J = 25°C T _J = 125°C	25 1	μA mA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		0.14	Ω

Symbol	Test Conditions	Characteristic Values			
		(T _J = 25°C, unless otherwise specified)	min.	typ.	max.
g_f	V _{DS} = 20 V; I _D = 0.5 • I _{D25} , pulse test	22	35	S	
C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz	4500		pF	
C _{oss}		700		pF	
C _{rss}		180		pF	
t _{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25} R _G = 2.0 Ω (External),	17		ns	
t _r		20		ns	
t _{d(off)}		56		ns	
t _f		14		ns	
Q _{g(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 • I _{D25}	130		nC	
Q _{gs}		26		nC	
Q _{gd}		58		nC	
R _{thJC}			0.25	K/W	
R _{thCK}	(TO-247)	0.25		K/W	

Symbol	Test Conditions	Characteristic Values			
		(T _J = 25°C, unless otherwise specified)	min.	typ.	max.
I _s	V _{GS} = 0 V		40	A	
I _{SM}	Repetitive; pulse width limited by T _{JM}		160	A	
V _{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		1.5	V	
t _{rr}	I _F = 25A, -di/dt = 100 A/μs, V _R = 100 V	1.0	250	ns	
Q _{RM}		10		μC	
I _{RM}				A	

TO-247 AD (IXFH) Outline


Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	.205	.225
L	19.81	20.32	.780	.800
L ₁		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	.232	.252
R	4.32	5.49	.170	.216
S	6.15	BSC	242	BSC

TO-268 Outline

 Terminals: 1 - Gate
 2 - Drain
 3 - Source Tab - Drain

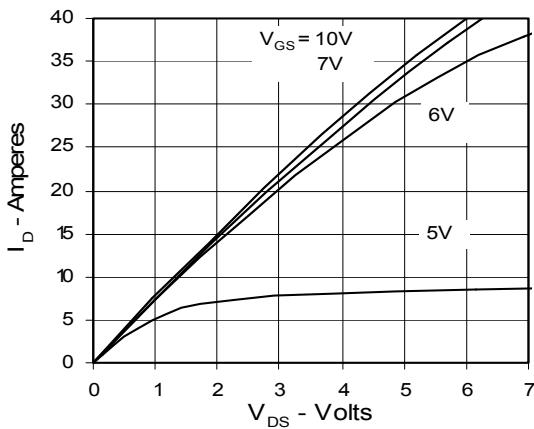
SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215	BSC	5.45	BSC
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010	BSC	0.25	BSC
L4	.150	.161	3.80	4.10

IXYS reserves the right to change limits, test conditions, and dimensions.

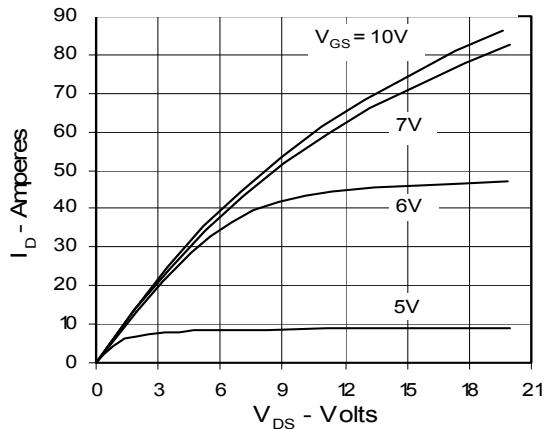
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1
 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343

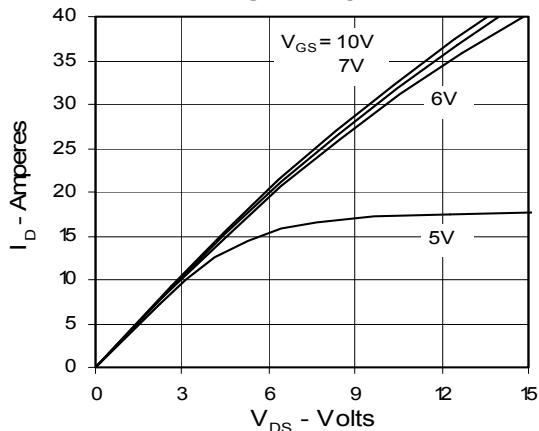
**Fig. 1. Output Characteristics
@ 25 Deg. C**



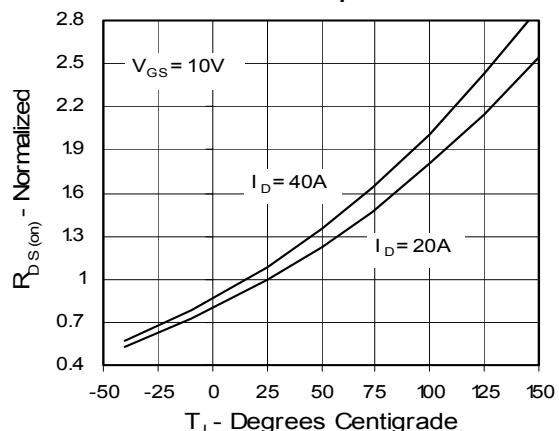
**Fig. 2. Extended Output Characteristics
@ 25 deg. C**



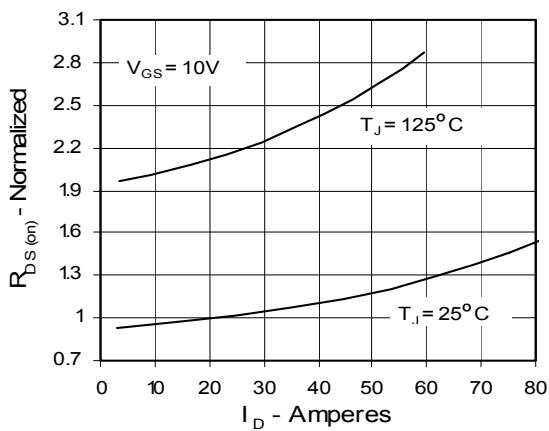
**Fig. 3. Output Characteristics
@ 125 Deg. C**



**Fig. 4. $R_{DS(on)}$ Normalized to I_{D25} Value vs.
Junction Temperature**



**Fig. 5. $R_{DS(on)}$ Normalized to I_{D25}
Value vs. I_D**



**Fig. 6. Drain Current vs. Case
Temperature**

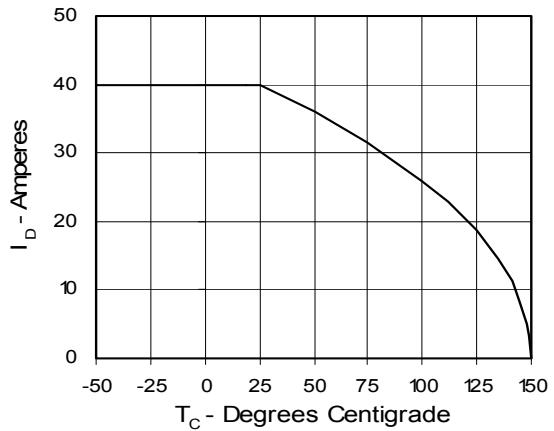
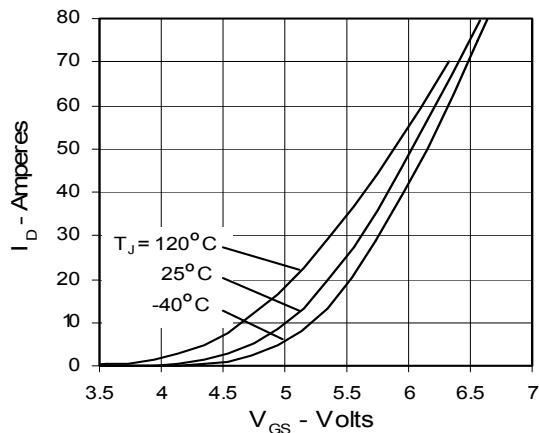
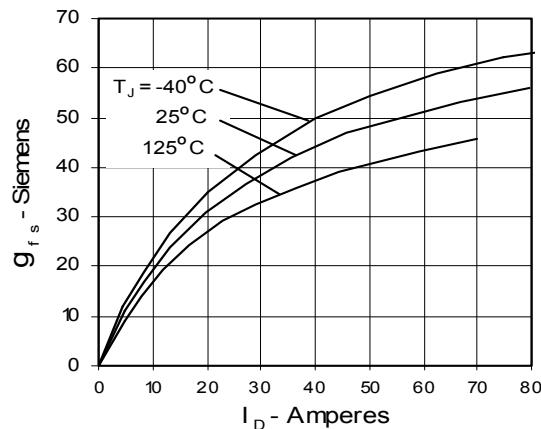
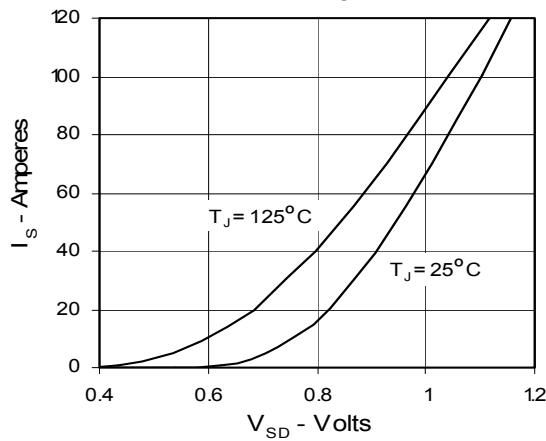
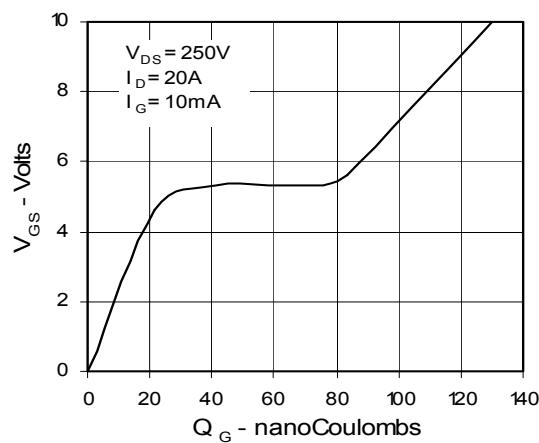
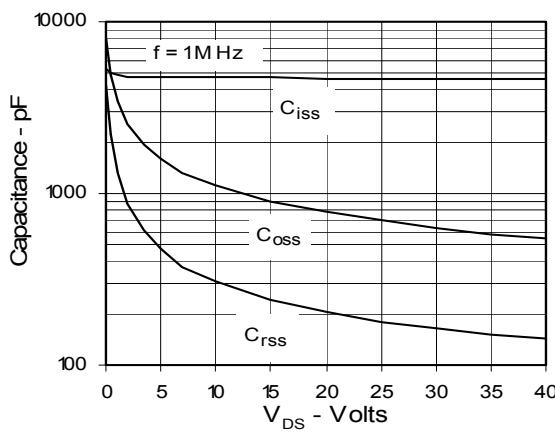
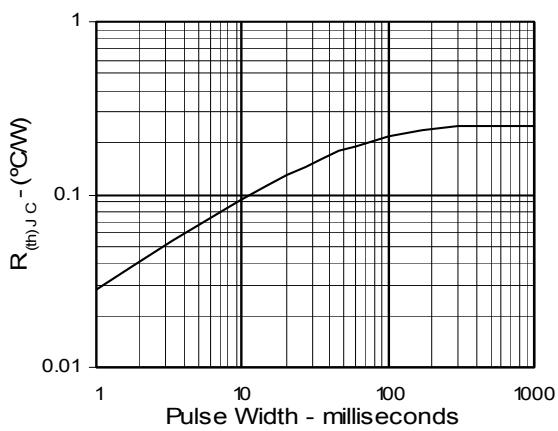


Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Source Current vs. Source-To-Drain Voltage

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Resistance


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